NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

RESIDUE MANAGEMENT, RIDGE TILL

(Acre)
Code 329C

DEFINITION

Managing the amount, orientation, and distribution of crop and other plant residues on the soil surface year-round, while growing crops on pre-formed ridges alternated with furrows protected by crop residue.

PURPOSES

This practice may be applied as part of a conservation management system to support one or more of the following purposes:

- Reduce sheet and rill erosion.
- Maintain or improve soil organic matter content.
- Modify wet site conditions.
- Provide food and escape cover for wildlife.
- Maintain or improve soil quality enhancing a favorable soil chemical and biological environment and nutrient availability through recycling source of plant residues.
- Conserve soil moisture, and maintain adequate infiltration rates, and enhance water storage.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all cropland and other land where crops are grown and adequate plant residues are produced.

This standard includes tillage and planting methods commonly referred to as ridge till or ridge planting. It does not include no-till planting on ridges, or bedding or listing operations, which bury crop residues.

CRITERIA

General Criteria Applicable to All Purposes Named Above

Following crop harvest and any secondary residue removal, residues shall remain on the surface until planting with no additional disturbance except for normal weathering.

Ridge height shall be maintained throughout the harvest and winter seasons by controlling equipment or livestock traffic.

After planting, residues shall be maintained in the furrows until the ridges are rebuilt by cultivation. Ridges shall be rebuilt to their original height and shape during the last row cultivation.

Loose residues to be retained on the field shall be uniformly distributed on the soil surface. Cultivation and planting equipment designed to operate on ridges shall be used, such as cultivators equipped with ridging attachments, and planters equipped with ridge planting attachments such as row cleaning devices and guidance systems.

Stable Outlets. Stable outlets must exist where ridges direct runoff to areas of concentrated flow. Grassed waterways, water and sediment control basins, or other suitable practices can be used to protect these areas.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact the Natural Resources Conservation Service.

Maximum Row Grade. Row grades shall not exceed —

10-Year EI	Maximum Row Grade (%)[1]
<100	9
100 – 150	7
>150	6

[1] Based on existing water erosion prediction technology.

If irrigation is used with this practice, use the row grade limitation for the next higher 10-year storm EI value. Where residue cover is less than 30 percent, use the maximum row grade for the next higher 10-year storm EI value.

Additional Criteria to Reduce Sheet and Rill Erosion

The amount and placement of residue needed, and the orientation of ridges in relation to the contour, shall be determined using current approved erosion prediction technology. Calculations shall account for the effects of other practices in the conservation management system. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed to assure adequate protection.

Planting and fertilizer placement shall disturb no more than one third of the row width. Soil and residue removed from the top of the ridge shall be moved into the furrow between the ridges.

After planting, the top of the ridge shall be maintained at least 3 inches higher than the furrow between the ridges.

The ridge shall be shaped to prevent erosion along the row by directing runoff to the protected furrow area.

Additional Criteria to Maintain or Improve Soil Organic Matter Content

The amount of residue needed to achieve the desired soil condition, shall be determined using the current approved soil conditioning index procedure. Partial removal of residue by means such as baling or grazing shall be limited to retain the amount needed. Calculations shall account for the effects of other practices in the conservation management system.

Cultivation to rebuild ridges shall be done using tools, which maintain residues in the surface layer.

Additional Criteria to Modify Wet Site Conditions

Ridge height prior to planting shall not be less than 6 inches. After planting, the top of the ridge shall be maintained at least 3 inches higher than the furrow between the ridges.

Additional Criteria to Provide Food and Cover for Wildlife

The amount of residue and height of stubble needed to provide cover shall be determined using an approved habitat evaluation procedure. Residues shall not be removed unless it is determined by the habitat evaluation procedure that removal will not adversely affect habitat values.

Additional Criteria to Maintain or Improve Soil Quality

The amount and kind of residues needed, soil type, texture, slope, and related soil properties shall be evaluated and determined using the current approved soil conditioning index procedure and soil quality indicators. Soil properties important to assess soil quality are the following: organic matter, infiltration, aggregation, pH, microbial biomass, forms of N, bulk density, topsoil depth, conductivity or salinity and available nutrients. Partial removal or residue by means such as baling or grazing shall be limited to retain the amount needed.

CONSIDERATIONS

Burning of plant residue or excess removal of residue by such means as baling or grazing often produces negative impacts on resources. These activities should not be performed without full evaluation of impacts on soil, water, animal, plants, and air resources.

Ridge till may be practiced continuously throughout some crop sequences, or may be managed as part of a residue management system which includes other tillage and planting methods such as mulch till or no till. In mixed systems, ridges must be periodically re-established. Selection of acceptable tillage methods for specific site conditions may be aided by an approved Soil Tillage Suitability Rating.

Production of adequate amounts of crop residues necessary for the proper functioning of this practice can be enhanced by selection of high residue producing crops and crop varieties in the rotation, use of cover crops, and adjustment of plant populations and/or row spacing.

By providing a choice of weed control methods, this practice can reduce herbicide require-ments when used in a conservation manage-ment system.

Where improvement of soil tilth is a concern, continuous ridge planting will allow organic material to accumulate in the surface horizon. Reconstruction of ridges in the same row area year after year will maximize organic matter buildup and biological activity in the row.

Soil compaction may be reduced by controlled traffic, where wheel traffic from all operations is limited to the area between designated rows or traffic areas.

Where ridges direct runoff to areas of concentrated flow, these areas can be protected by grassed waterways, water and sediment control basins, underground outlets, or other suitable practices.

Leaving rows of unharvested crop standing at intervals across the field can enhance the value of residues for wildlife habitat.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Main-tenance described in this standard. Specifi-cations shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

The following should be specified for residue management use: 1) The critical erosion period which the crop residue must be present, 2) The amount of crop residue, orientation and distribution that must be present to meet the planned purpose, and 3) Estimate percent ground cover or measure actual residue cover using the line transect method.

OPERATION AND MAINTENANCE

No operation and maintenance requirements, national in scope, have been identified for this practice.